

ParaDocsHealth

**Using a ML-Enabled EMR Provider Workflow to Improve Patient Care
& Streamline Non-Clinical Tasks**

SHPCP October 2023 Lunch & Learn

No Time For Healthcare ?



My Journey



Omar Mohtar
(MD / PHD)
Founder
Chief Executive Officer



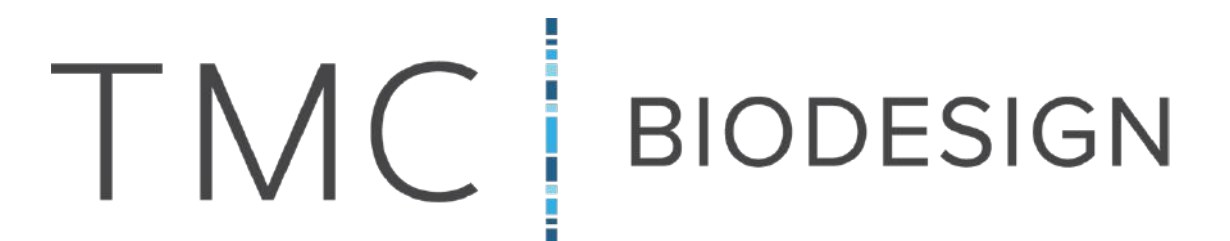
Boston University School of Medicine

Spent half of workday doing paperwork

Not enough time with patients. I'm not alone

Doctors unable to practice at the top of their license

Texas Medical Center Innovation
Surveyed 100 doctors in Houston...



Why Now ?

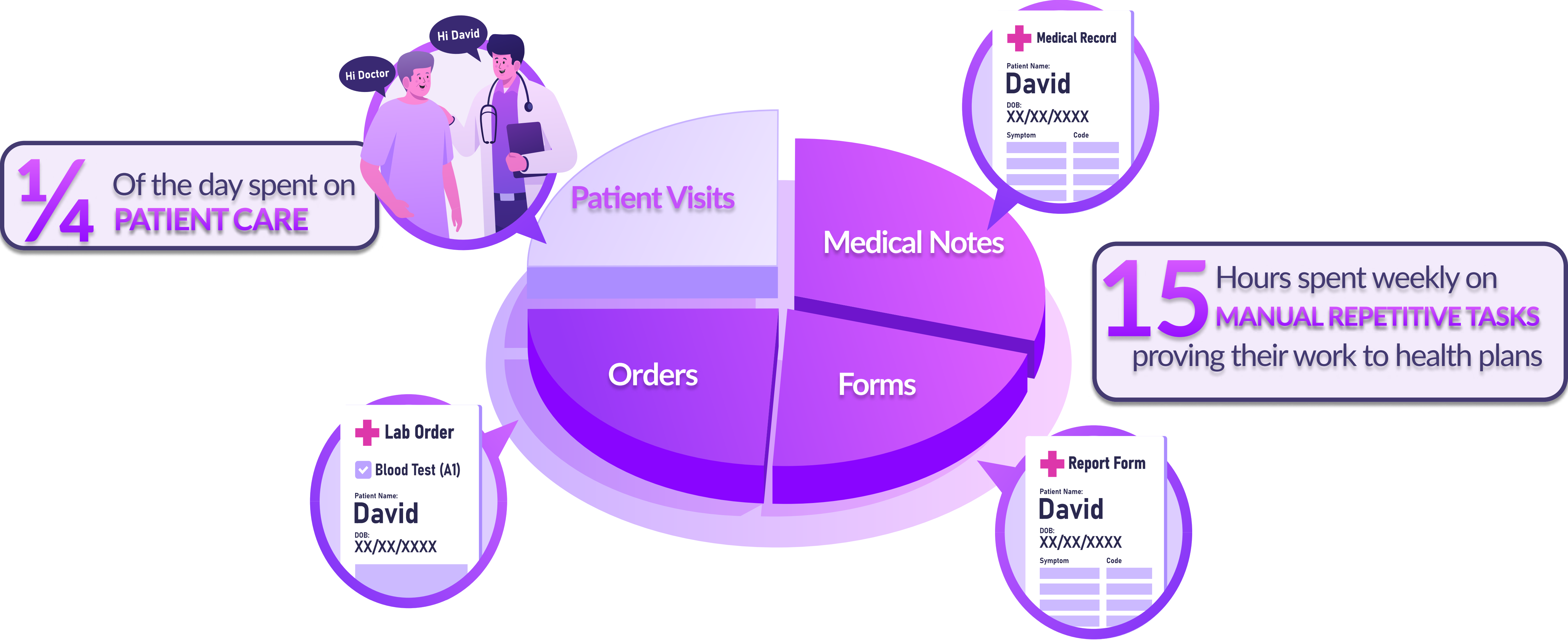


* CMS.gov (2022 MA Enrollment Report)

** AAMC.org (2021 Press Release)

*** Bain & Company (2023 Report)

Reporting to Health Plans: Bottleneck to Quality Care



Health Plans capture proof-of-work from providers for approvals, reimbursement, and financial incentives

What If....

**We can optimize quality care
and reporting without
burdening healthcare providers?**





Pilot Study

Mid-sized Clinic

3,000 patients / month

Problem:

- 5x documentation volume
- Manually Intensive Process
- Care gaps fall between cracks

Impact:

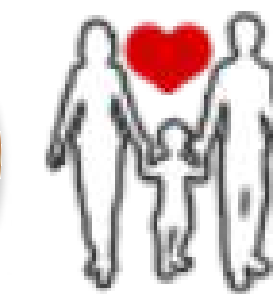
5 week study

10 minutes saved / visit

Additional Revenue Stream for Practice

- Increase reimbursement
- Decrease overhead
- New patient visits

More patient engagement

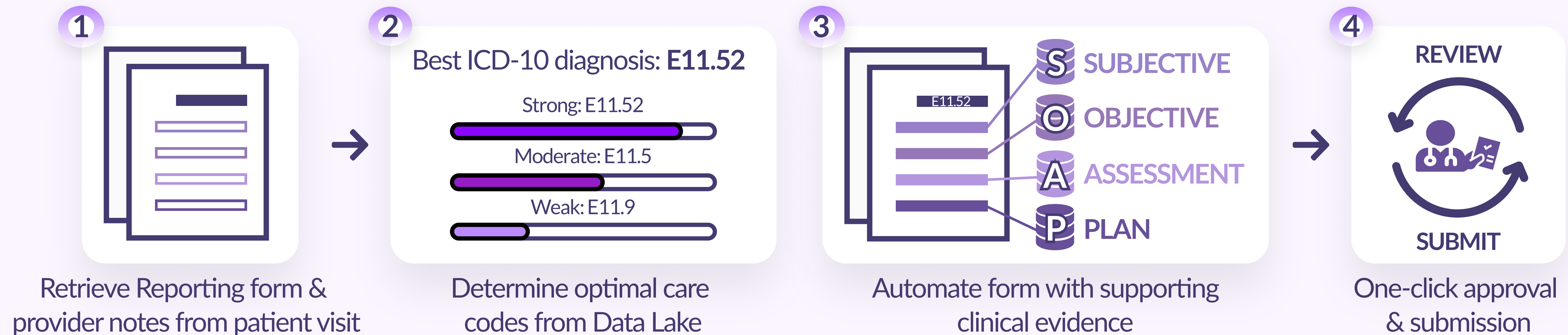


CYPRESS PHYSICIAN
ASSOCIATION

Dr. Glenn Davis, MD

“ Working with ParaDocs Health allowed me to spend more time with patients and accurately fill out the necessary paperwork for reimbursement. ”

Augmented-Automation Workflow



Patient Assessment Form Study

Patient Assessment Form

2020 Healthcare Quality Patient Assessment

The Optum in-office assessment program is developed and administered by Optum on behalf of (Client). Use for 2020 date(s) of service; past screening documentation may be outside of this date range.

Participation is eligible for up to \$XX when submitted accurately and timely. See Administrative Reimbursement.

Submit via traceable carrier, Optum Uploader, or secure fax (1-972-957-2145). See Additional Instructions.

QR Code

Patient: MbrLastName, MbrFirstName

Member ID: XXXXXXXX

DOB: MM/DD/YYYY

Phone: ###-###-####

Provider Information

Check box to confirm the provider completing the assessment. Enter name/NPI if not populated.

Provider: PCP Name 1

NPI:

Provider:

NPI:

Care Priority: 1

Emergency Room visits (3), High Risk Medications (3), Medication Adherence Gap (3)

Ongoing Assessment & Evaluation

Check the appropriate box. All conditions 'Assessed and Diagnosed' (which means the condition was evaluated, present and appropriately documented during a 2020 encounter) must be supported in the medical chart provided. If any suspected condition is reported as 'Assessed and Not Diagnosed', the Evaluating Practitioner Name and Date of Service must be reported covering all conditions assessed during the encounter.

HCC

Potential Diagnosis Designate Specificity

Risk Factors, Co-morbid Conditions or Screenings

Assessed and Diagnosed

Assessed and Not Diagnosed

Referred

Not Assessed

135

Acute Renal Failure (N17.-)

GFR test value was 57.9

022

Morbid Obesity (E66.01, E66.2, Z68.4-)

Previously Coded: Morbid Obesity (E66.01)

157

Pressure Ulcer w/ Necrosis to Muscle, Tendon, Bone; consider location, laterality & stage (L89.-4, L89.-4)

Previously Coded ICD-10: Aseptic Necrosis (733.XX)

If any suspected condition is reported above as 'Assessed and Not Diagnosed', the Evaluating Practitioner Name and Date of Service must be reported covering all conditions assessed during the encounter.

Evaluating Practitioner Name:

Date of Service:

Preventive Medicine Screening

Indicate if screening/referral(s) were completed by checking the appropriate box.

The following screening(s) are due or overdue, as indicated by HEDIS & health plan data. Evidence of results, referrals, and exclusions must be included in medical record documentation submitted with this assessment.

Screenings to Consider

Outcome

Exclusion

Body Mass Index (BMI & Weight required)

Recommended for adults 18-74 at each outpatient visit

Completed

Unable to weigh

Refused

Age/Sex

Pregnant

Breast Cancer Screening

No claims for breast cancer screening in the current or prior calendar year

Completed

Referred

Refused

Age/Sex

Bilateral Mastectomy

2 Unilateral Mastectomies

Colorectal Cancer Screening

No claims for fecal occult screening in the last 12 months; sigmoidoscopy in last 5 years; nor colonoscopy in the last 10 years

Completed

Referred

Refused

Age/Sex

Colorectal Cancer

Total Colectomy

Managing Chronic Illness

Indicate actions performed by checking the appropriate box.

The following action(s) are due or overdue, as indicated by HEDIS & health plan data. Evidence of assessment or a referral (where applicable) must be included in medical record documentation submitted with this assessment.

Conditions

Suggested Action

Yes

N/A

No

Controlled Blood Pressure*

Blood Pressure Evaluation

Diabetes Mellitus*

Diabetic Eye Exam (Yes indicates referral or completed)

Rheumatoid Arthritis

HbA1c Testing

Nephropathy Screening

Prescription Treatment

*As of run date, member is not yet eligible for measure per HEDIS specifications; measure triggered based on member history.

HealthPlan: 00001, Group Name

Page 1 of 2020 Client Request ID

Run Date: 02/11/2020 Project ID, Review Type

This information is a summary of previously reported diagnoses, from multiple sources and is not intended to be used in place of medical diagnosis or treatment. Any HIV/AIDS and substance abuse conditions, whether present or not, are not part of this assessment.

Key Performance Indicators	2022	2023 
Number of Forms	160	180
Personnel Time	30 Hours	5 hours
Total Submitted	48%	100%
Time Spent/Month	30 Hrs	5 Hrs
Accuracy	10%	98%
Risk-Adjusted Factor (RAF) Score Improvement		+ 3%
Impact on Revenue per Provider		+ <u>\$19,000</u>

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Care Gap Closure Study

DIAGNOSTIC PROCEDURE ORDER FORM

Cardiopulmonary Stress Testing & Ultrasound

Frontera Fax: 877-631-0737

Frontera Phone: 866-945-8700

Client.teamfrontera.com

Patient Name (Last)-PLEASE PRINT

_____/_____/_____

Date of Birth

Patient Name (First)-PLEASE PRINT

_____/_____/_____

Test Date

_____:_____ AM/PM

_____/_____/_____

Test Time

_____/_____/_____

_____/_____/_____

Ordering Physician

Frontera ID#

Gender

Height

Weight

BMI

CMET/CARDIOPULMONARY STRESS TEST

All Inclusive ICD-10 Codes cover both Cardiac & Pulmonary requirements for CMET as well as Resting Echo

If an All inclusive ICD-10 codes does not apply, select at least one cardiac & one pulmonary code in the sections below to cover a CMET

☐ CMET only includes all of the following CPT codes: 94621, 94375, 94727, 94729

ALL INCLUSIVE CODES

☐ R06.09-Other forms of Dyspnea

☐ R06.02 Shortness of Breath

☐ Other ICD-10 code(s) and narrative: _____

Please provide ALL applicable ICD-10 codes for all test(s) ordered

CARDIAC CODES Please select:

☐ I10 Essential Primary Hypertension*

☐ I20.0 Unstable angina*

☐ I20.8 Other forms of angina pectoris*

☐ I24.0 Acute coronary thrombosis not resulting in myocardial infarction*

☐ I24.8 Other forms of acute ischemic heart disease*

☐ I25.110 Atherosclerotic heart disease of native coronary artery with unstable angina pectoris*

☐ I25.5 Ischemic cardiomyopathy*

☐ I27.0 Primary pulmonary hypertension*

☐ I27.89 Other specified pulmonary heart diseases

☐ I34.2 Nonrheumatic mitral (valve) stenosis*

☐ Other ICD-10 code(s) and narrative

☐ I35.0 Nonrheumatic aortic (valve) stenosis*

☐ I35.1 Nonrheumatic aortic (valve) insufficiency*

☐ I42.1 Obstructive hypertrophic cardiomyopathy*

☐ I48.19 Other persistent atrial fibrillation*

☐ I50.22 Chronic systolic (congestive) heart failure

☐ I50.89 Other heart failure

☐ R00.2 Palpitations

☐ R00.8 Abnormal Heart Sounds-Other

☐ Z86.16 Personal History of COVID-19*

*May require additional coding

PULMONARY CODES Please refer to CMET area above

☐ J47.0 Bronchiectasis w/ acute lower respiratory infection

☐ J47.1 Bronchiectasis w/ (acute) exacerbation

☐ J47.9 Bronchiectasis- uncomplicated

☐ J84.111 Idiopathic interstitial pneumonia-NOS

☐ J84.112 Idiopathic pulmonary fibrosis

☐ J84.113 Idiopathic non-specific interstitial pneumonitis

☐ J84.114 Acute interstitial pneumonitis

☐ J84.115 Respiratory bronchiolitis interstitial lung disease

☐ R05.1 Acute Cough

☐ R05.2 Subacute Cough

☐ R05.3 Chronic Cough

☐ R05.4 Cough Syncope

☐ Other ICD-10 code(s) and narrative

☐ R05.8 Cough-Other Specified

☐ R06.01 Orthopnea

☐ R06.02 Shortness of breath

☐ R06.09 Other forms of dyspnea

☐ R06.1 Stridor

☐ R06.2 Wheezing

☐ R06.3 Periodic breathing

☐ R06.4 Hyperventilation

☐ R06.82 Tachypnea, NOS

☐ R06.89 Other abnormalities of breathing

☐ Z86.16 Personal History of COVID-19*

☐ Z87.09 Personal HX of other diseases of the respiratory system*

*May require additional coding

PULMONARY FUNCTION TEST CODES Please select :

☐ Pulmonary Function Test

☐ Pulmonary Function Test Pre/Post Bronchodilator

J22 Acute (lower) respiratory (tract) infection NOS

J40 Bronchitis-NOS

J44.0 COPD w/Acute LRI

J44.1 COPD w/Acute Exacerbation

J43.9 Emphysema-unspecified

J45.20 Mild Intermittent Asthma-NOS*

J45.30 Mild Persistent Asthma-NOS*

☐ Other ICD-10 code(s) and narrative

J45.40 Moderate Persistent Asthma-NOS*

J45.50 Severe Persistent Asthma-NOS*

J45.909 Unspecified Asthma-NOS*

J45.990 Exercise Bronchospasm*

J45.991 Cough variant asthma*

J45.998 Other asthma*

☐ R05.8 Other specified cough*

R06.02 Shortness of Breath

R06.2 Wheezing

R06.09 Other Forms of Dyspnea

R06.81 Apnea-NOS*

R06.89 Other abnormalities of breathing

Z86.18 PRSN History of COVID-19*

Z87.09 PRSN HX of other diseases of the respiratory system

*May require additional coding

CHOCARDIOGRAM CODES Please select:

☐ I09.89 Other specified rheumatic heart disease

☐ I10 Essential Primary Hypertension*

☐ I11.0 Hypertensive heart disease W/ Heart failure*

☐ I11.9 Hypertensive heart disease W/O Heart failure*

☐ I25.2 Old myocardial infarction*

☐ I25.89 Other forms of chronic ischemic heart disease *

☐ I34.1 Mitral Valve Prolapse

☐ I34.2 Nonrheumatic mitral (valve) stenosis

☐ I35.2 Aortic Stenosis

☐ Other ICD-10 code(s) and narrative

☐ I49.2 Premature Beats-Junctional*

☐ I49.3 Premature Beats-Ventricular*

☐ R00.2 Palpitations*

☐ R01.0 Benign/Innocent Cardiac Murmur*

☐ R01.1 Cardiac Murmur-NOS

☐ R06.02 Shortness of Breath

☐ R06.09 Other Forms of Dyspnea

☐ R07.81 Pleurodynia*

☐ R07.82 Chest Pain-Intercostal*

R55 Syncope & Collapse*

R91.8 ABN Findings of Lung Field-unspecified*

R93.1 ABN findings on diagnostic imaging of heart and coronary circulation*

R94.31 ABN EKG*


T50.905S Adverse effect of NOS Drug** cannot be billed alone

U07.1 COVID-19

Z86.16 PRSN HX of COVID-19*

Z87.74 PRSN HX of (corrected) congenital malformations of heart and circulatory system

*May require additional coding

Key Performance Indicators	2022	2023 
Number of Orders	7.5 order / Mo	72 orders / Mo
Gaps Identified	Order Volume (By Test) <ul style="list-style-type: none">AAA Scan (6)Arterial Doppler (31)Carotid Doppler (16)Pulmonary Function Test (12)Resting Echocardiogram (7)	
Gaps Closed	15%	25%
Risk-Adjusted Factor (RAF) Score Improvement		+ 5%
Impact on Revenue per Provider		+ \$4,000/ Mo

Conclusions and Implications

- Promising impact of ML-enabled workflows for primary care
- Eliminating manual search, data sourcing, and data entry saves healthcare providers time & money
- Identifying at-risk patients with a clinical need for diagnostic evaluations and preventative screenings will proactively close care gaps and foster better health outcomes

Integrating AI/ML technology within a provider's workflow can reduce administrative burdens and improve operational efficiency and fiscal accountability.

Challenges and Lessons

EMR Implementation

- Fragmented EMR workflows
- **Lack of transparency in EMR** for patients being seen by specialists – improving transparency will lead to better care gap identification & diagnostic order automation

Care Gap Order Automation

- **Patient engagement** was the biggest factor that contributed to non-compliance reasons (e.g., cancelled orders, clinical cause, lack of patient response, patient refusal)
 - Improving patient engagement will lead to higher order conversion

Next Steps

ML & AI Explainability

- Focusing on transparency behind ML & AI decisions will foster better adoption of ML & AI tools in the clinical space

Patient Risk Management

- RAF Score

Additional Performance Metrics of Provider Proficiency

- CMS Star Rating, HEDIS Score, MIPS Score, CAHPS

Explainability

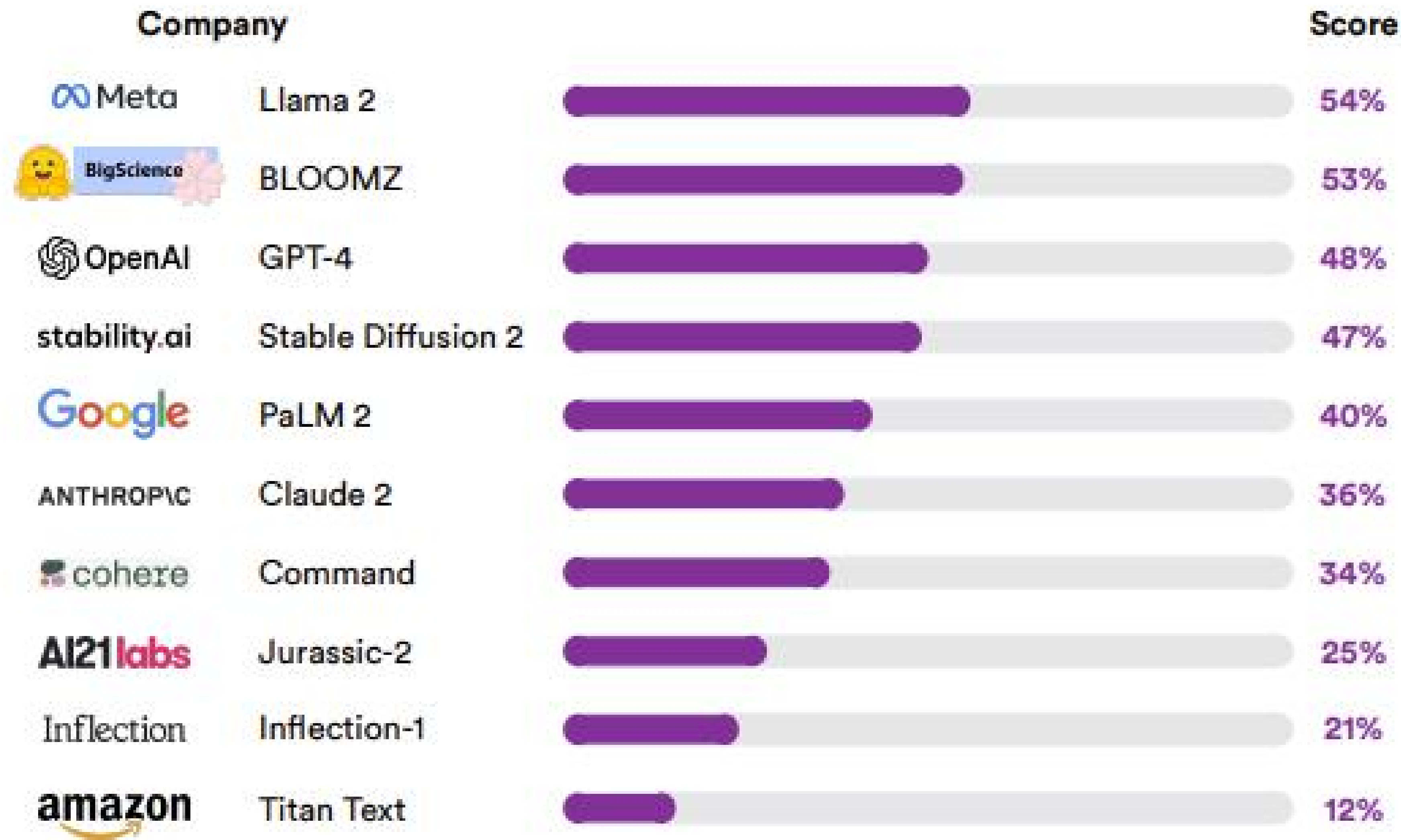
Why Digital Health Technologies should care:

- non-technical users don't understand them well (blackbox)
- How or when they work (background)
- Grasping the impact across society

Can easily go wrong with big tech

- **Transparency-washing**, (Zalnieriute, 2021)
- **Gamification**, (Charles AE Goodhart. 1984. Problems of monetary management: the uk experience. In Monetary theory and practice, pages 91–121. Springer)
- **Promote surveillance**, (Han, 2015; Mohamed et al., 2020; Birchall, 2021)

Foundation Model Transparency Index Scores, 2023



Source: [Foundation Model Transparency Index \(stanford.edu\)](https://foundationmodeltransparencyindex.stanford.edu)

Poorest Performing Areas

Upstream Indicators

Copyrighted data: For all data used in building the model, is the associated copyright status disclosed?
Data license: For all data used in building the model, is the associated license status disclosed?
Personal information in data: For all data used in building the model, is the inclusion or exclusion of personal information in that data disclosed?
Use of human labor: Are the phases of the data pipeline where human labor is involved disclosed?
Employment of data laborers: Is the organization that directly employs the people involved in data labor disclosed for each phase of the data pipeline?
Geographic distribution of data laborers: Is geographic information regarding the people involved in data labor disclosed for each phase of the data pipeline?
Wages: Are the wages for people who perform data labor disclosed?
Instructions for creating data Are the instructions given to people who perform data labor disclosed?
Labor protections: Are the labor protections for people who perform data labor disclosed?
Third party partners: Are the third parties who were or are involved in the development of the model disclosed?

Downstream Indicators

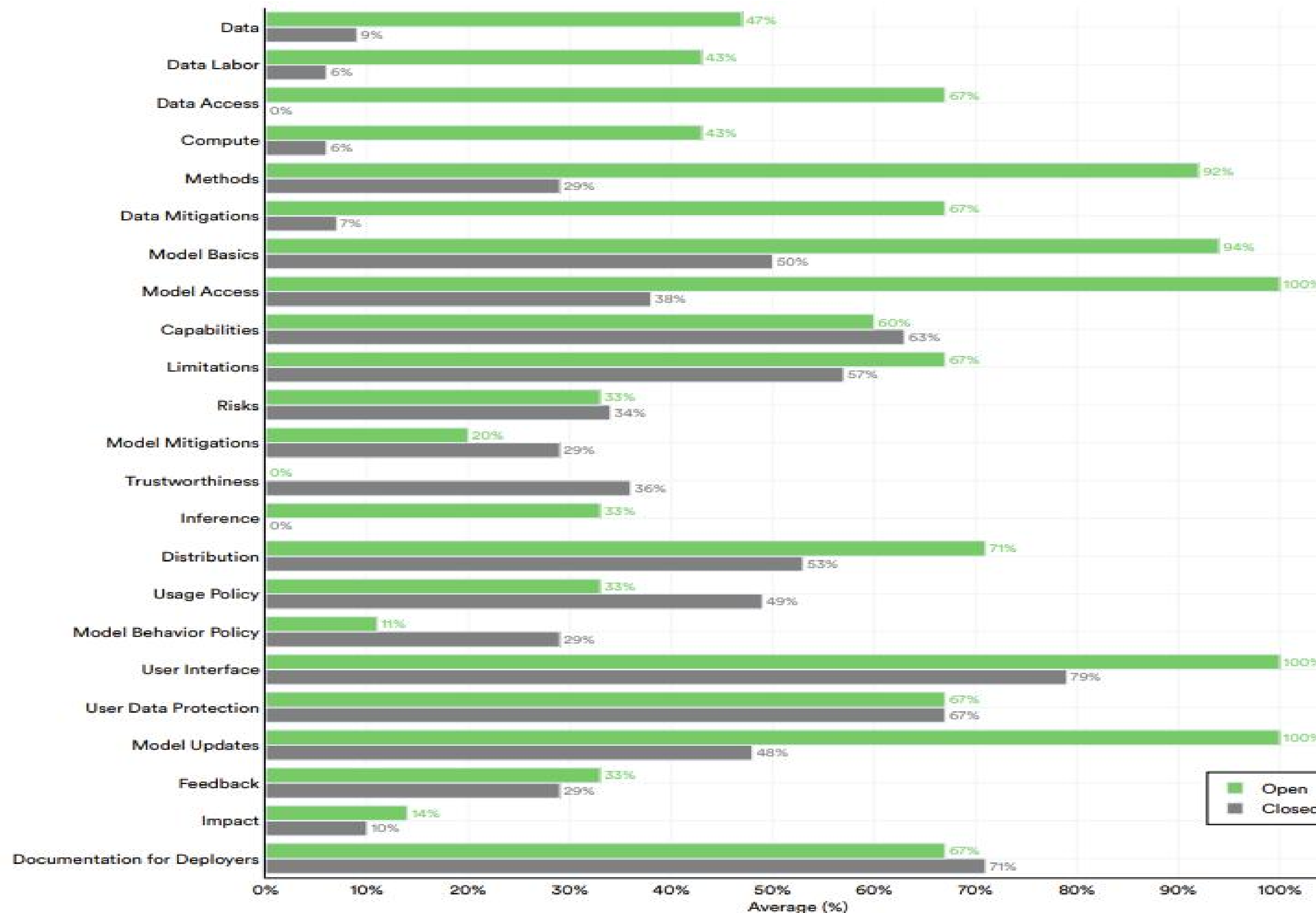
Permitted and prohibited users: Is a description of who can and cannot use the model disclosed?
Permitted, restricted, and prohibited uses: Are permitted, restricted, and prohibited uses of the model disclosed?
Usage policy enforcement: Is the enforcement protocol for the usage policy disclosed?
Justification for enforcement action: Do users receive a justification when they are subject to an enforcement action for violating the usage policy?
Usage policy violation appeals mechanism: Is a mechanism for appealing potential usage policy violations disclosed?
Permitted, restricted, and prohibited model behaviors: Are model behaviors that are permitted, restricted, and prohibited disclosed?
Model behavior policy enforcement: Is the enforcement protocol for the model behavior policy disclosed?
Interoperability of usage and model behavior policies: Is the way that the usage policy and the model behavior policy interoperate disclosed?

Model Indicators

Risks description: Are the model's risks disclosed?
Risks demonstration: Are the model's risks demonstrated?
Unintentional harm evaluation: Are the model's risks related to unintentional harm rigorously evaluated, with the results of these evaluations reported prior to or concurrent with the initial release of the model?
External reproducibility of unintentional harm evaluation: Are the evaluations of the model's risks related to unintentional harm reproducible by external entities?
Intentional harm evaluation: Are the model's risks related to intentional harm rigorously evaluated, with the results of these evaluations reported prior to or concurrent with the initial release of the model?
External reproducibility of intentional harm evaluation: Are the evaluations of the model's risks related to intentional harm reproducible by external entities?
Third party risks evaluation: Are the model's risks evaluated by third parties?
Mitigations description: Are the model mitigations disclosed?
Mitigations demonstration: Are the model mitigations demonstrated?
Mitigations evaluation: Are the model mitigations rigorously evaluated, with the results of these evaluations reported?
External reproducibility of mitigations evaluation: Are the model mitigation evaluations reproducible by external entities?
Third party mitigations evaluation: Can the model mitigations be evaluated by third parties?
Trustworthiness evaluation: Is the trustworthiness of the model rigorously evaluated, with the results of these evaluations disclosed?
External reproducibility of trustworthiness evaluation: Are the trustworthiness evaluations reproducible by external entities?
Inference duration evaluation: Is the time required for model inference disclosed for a clearly-specified task on a clearly-specified set of hardware?
Inference compute evaluation: Is the compute usage for model inference disclosed for a clearly-specified task on a clearly-specified set of hardware?

Source: [Foundation Model Transparency Index \(stanford.edu\)](#)

Foundation Model Transparency Index Scores, 2023



Closed Developers struggle in:

Data, Data Labor, Data Access, Compute, Data Mitigation, Model Basics, Inference

Open Developers struggle in:

Model Mitigation, Trustworthiness, Model Behavior Policy

Built by Doctors, for Doctors



Omar Mohtar
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Physician Innovator



Dhini Nasution
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Clinical AI Specialist



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Thank You

 ParaDocsHealth

Remember the Dream

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